Find θ

① $\cos\theta = \frac{1}{2}$

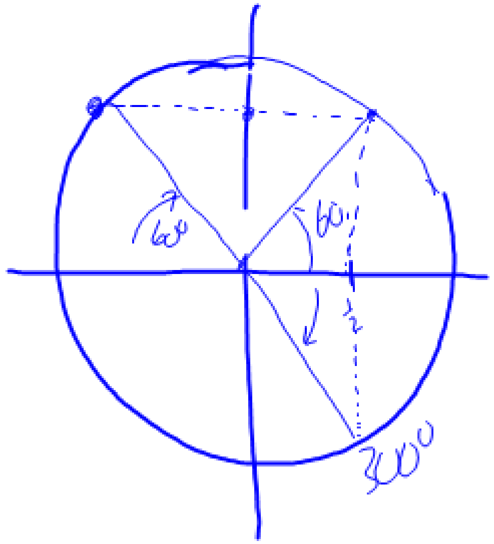
$60°, 300°$

② $\cos\theta = 0$

$90°, 270°$

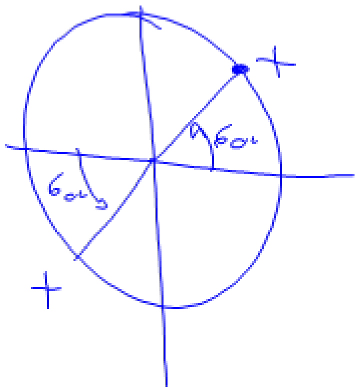
③ $\sin\theta = \frac{\sqrt{3}}{2}$

$60°, 120°$



④ $\tan\theta = \sqrt{3}$

$60°, 240°$



⑤ $\csc\theta = 2$

$30°, 150°$

$\sin\theta = \frac{1}{2}$

Sin

From angle $\longrightarrow$ value

D R

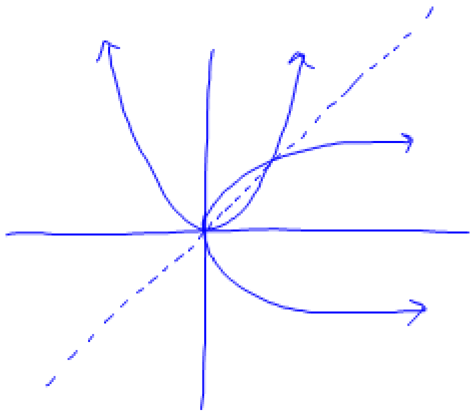
$\longrightarrow$ $\sin^{-1}$

Value $\longrightarrow$ angle

D R

Inverse

- opposite
- flipping x + y-values
- graphically flipped over y=x line



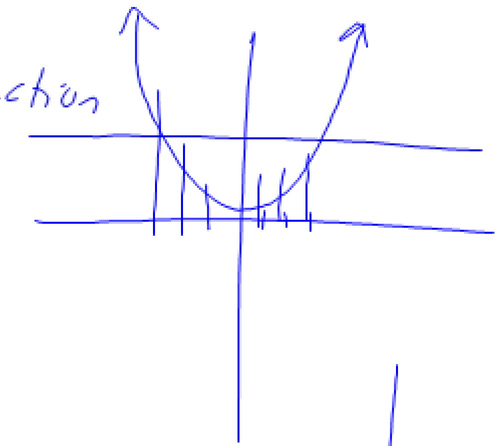
- original: $y=2x-3$

  $x=2y-3$

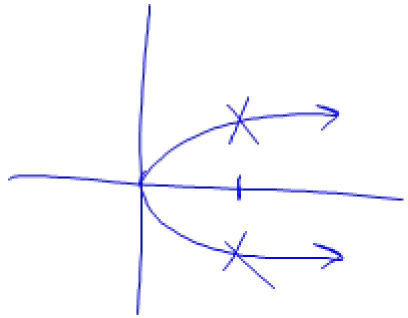
inverse: $y=\frac{x+3}{2}$

Function, $f(x)$

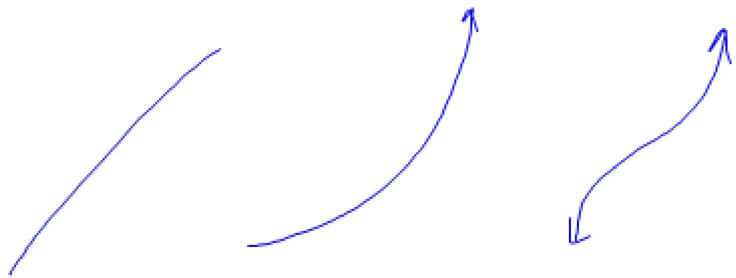
- vertical line test - test to see if function
- one output for every input



- horizontal line test
  checks to see if the inverse is a function

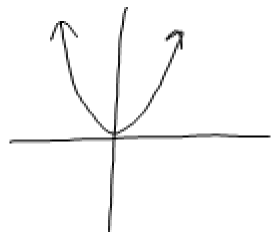


- Those functions that pass both vert. & horizontal are one-to-one

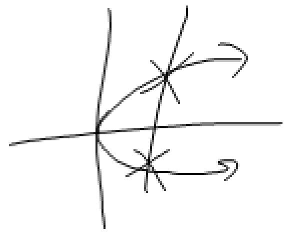


Domain Restrictions

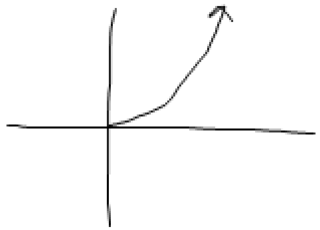
→ $y = x^2$ is <u>not</u> one-to-one



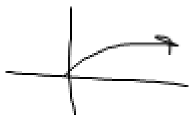
→



$y = x^2, \quad x \geq 0$

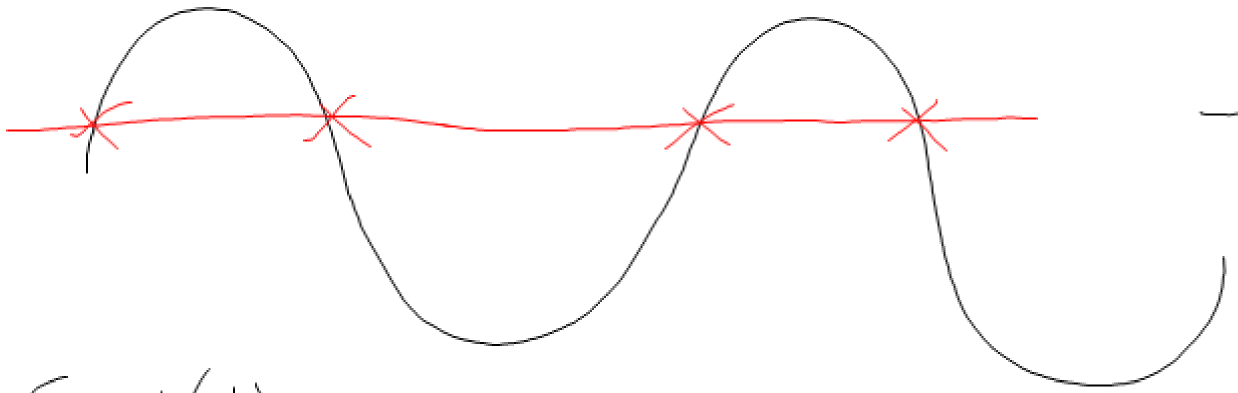


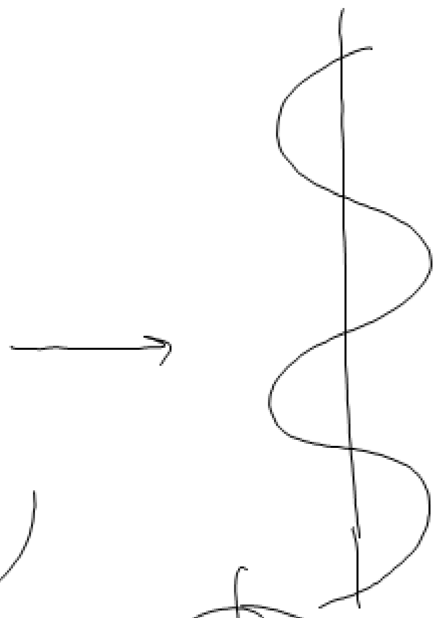
→ $y = \sqrt{x}$

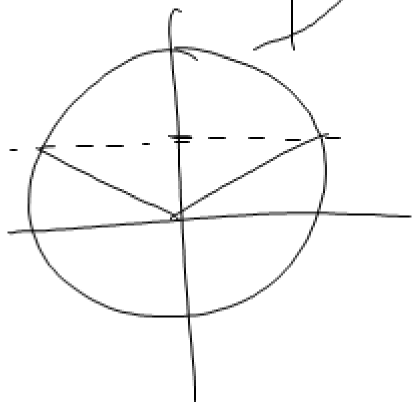


sin/cos

Inverse is <u>not</u> a function

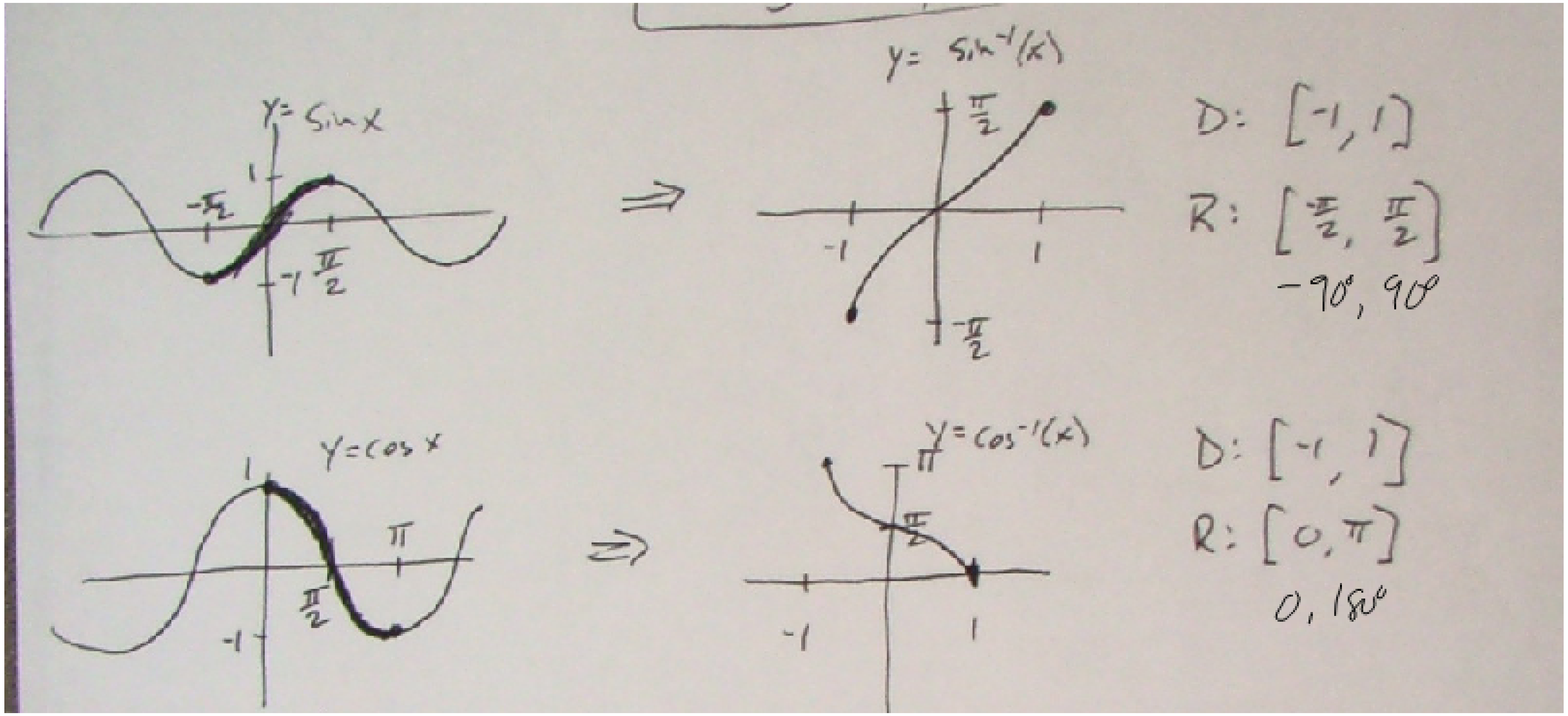






$\sin^{-1}\left(\frac{1}{2}\right)$ = infinite answers

..., $-210°$, -330, $30°$, $150°$, 390, $510°$, ...



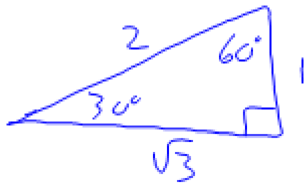
$\sin\left(-\frac{1}{2}\right) = -30^\circ$

$-\frac{\pi}{6}$

Find y

$y = \cos^{-1}\left(\frac{1}{2}\right)$

$\frac{\pi}{3}, 60^\circ$



$y = \sin^{-1}\left(-\frac{\sqrt{3}}{2}\right)$

-60°, $\cancel{300^\circ}$

$\cancel{240^\circ}$, $\cancel{-120^\circ}$

$y = \csc^{-1}(-2)$

Both D: $[-1, 1]$

$\sin^{-1}$ R: $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

$\cos^{-1}$ R: $[0, \pi]$

$\arcsin(x) = \sin^{-1}(x)$

$\arctan(x) = \tan^{-1}(x)$

$\arccos(x) = \cos^{-1}(x)$

$\operatorname{arcsec}(x) = \sec^{-1}(x) = \cos^{-1}\left(\frac{1}{x}\right)$

$\operatorname{arccsc}(x) = \csc^{-1}(x) = \sin^{-1}\left(\frac{1}{x}\right)$

$$\operatorname{arccot}(x) = \begin{cases} \tan^{-1}\left(\frac{1}{x}\right), & x > 0 \\ \tan^{-1}\left(\frac{1}{x}\right) + \pi, & x < 0 \\ \frac{\pi}{2}, & x = 0 \end{cases}$$

$\boxed{\sec x = y}$

$\sec^{-1}(x) \Rightarrow \sec y = x$

$\frac{1}{\cos y} = x$

$\cancel{\cos^{-1}} \cos y = \frac{1}{x}$

$\boxed{y = \cos^{-1}\left(\frac{1}{x}\right)}$

or simplify

$\cot^{-1}(x) = \frac{\pi}{2} - \tan^{-1}(x)$

Sect. 6.1

#1-20, 25-29, 58

☆ Subject to change ☆

M – 6.1 A

T – 6.1 B

W – 6.2

R – 6.2 B

F – 6.3

M – 6.1-6.3 Review

Quiz

T – 6.4

W – extra

R – Review

F – Test

M, T – Final Review

F – Final